C-A OPERATIONS PROCEDURES MANUAL

7.1.53 RHIC Ring Pre-Cool Via Heat Shield Supply

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Hand Processed Changes

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Approved: _____***Signature on File***_____ _____
Collider-Accelerator Department Chairman Date

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7.1.53 RHIC Ring Pre-Cool Via Heat Shield Supply

1. Purpose

To provide instruction for pre-cooling of the Blue and Yellow rings for contamination removal.

2. Responsibilities

2.1 The Shift Supervisor, or an Operator designated by the Shift Supervisor, is responsible for conducting the procedure and providing documentation in the Cryogenic Control Room Log and in the Cryogenic Valve Log.

2.2 Should a problem arise during the cooldown process, the Shift Supervisor shall report to the Technical Supervisor for instructions before continuing.

3. Prerequisites

3.1 Ring scrubbed per C-A-OPM 7.1.14, "RHIC Ring Scrub".

3.2 Refrigerator operating per C-A-OPM 7.1.55, "25 KW Helium Refrigerator Pre-Cool".

3.3 VJRR shield flow established per phase 1 of C-A-OPM 7.1.25, "Liquid Storage Cooldown and Fill Procedure".

4. Precautions

4.1 If the refrigerator is operating, all personnel entering the refrigeration wing of Building 1005R must have a Personal Oxygen Monitor (POM) and carry an emergency escape pack.

4.2 This procedure assumes the VJRR heat shield is aligned through 6:00 Yellow Valve Box. If the 6:00 Blue Valve Box is used, valve selection must be adjusted accordingly.

5. Procedure

5.1 Cooldown of Blue and Yellow magnet lines via refrigerator head shield supply.

The following flow path will be aligned:

Heat shield supply to supply line, supply line to magnet line (in parallel CW and CCW from 6:00 Valve Box to 12:00 Valve Box), magnet line to utility line, utility line to cooldown return.

_____ 5.1.1 Verify valve positions as specified in C-A-OPM ATT 7.1.53.a.

_____ 5.1.2 Ensure the following refrigerator valves are closed:
H5M____, H1100M____, H1103M____, H26A____, H4644A____.

_____ 5.1.3 Ensure the following refrigerator valves are open:
H849A____, H4643A____, H4658A____.

_____ 5.1.4 Open valves H6716A____ and H6616A____ at 6:00 Yellow Valve Box (YVB).

_____ 5.1.5 To establish flow through the Yellow magnet line, slowly open valves H6715A____ and H6615A____ at 6:00 YVB.

_____ 5.1.6 Open valves H4616A____ and H4516A____ at 6:00 Blue Valve Box (BVB).

_____ 5.1.7 To establish flow through the Blue magnet line, slowly open valves H4615A____ and H4516A____ at 6:00 BVB.

_____ 5.1.8 Monitor CR temperature at refrigerator (TI105H). When TI105H is within 10^{o}K of TI304 (TI704) at HX1/2 low pressure inlet, make bypass to valve H425M____ or H825M____.

_____ 5.1.9 Open valve H6402A____ at the 4:00 YVB and valve H4502A____ at the 6:00 BVB.

_____ 5.1.10 Pressurize both Yellow and Blue rings (common at HR) through valve H6702A or valve H4602A and set valves H6702A____ and H4602A____ to approximately 60% open.

_____ 5.1.12 Ensure valves H776M____ and H376M____ are closed.

_____ 5.1.13 Slowly open valve H156M.

_____ 5.1.14 Throttle valve H9A to control shield flow so that it propagate at approximately the same rate as the magnet cold wave.

_____ 5.1.15 When dew point reading is below – 40^{o}C and oxygen reading is less than 10 ppm (as read at compressor discharge), isolate ring and start refrigerator warmup per C-A-OPM 7.1.56, “25 KW Refrigerator Warmup and Subsequent Cooldown For Contamination Removal”.

6. Documentation

6.1 The check off lines of the procedure are for place keeping only. The procedure is not to be initialed or signed, it is not a record.

6.2 The Shift Supervisor shall document the completion of the procedure in the Cryogenics Control Room Log.

7. References

7.1 C-A-OPM 7.1.14, "RHIC Ring Scrub".

7.2 C-A-OPM 7.1.55, "25 KW Helium Refrigerator Pre-Cool".

7.3 C-A-OPM 7.1.25, "Liquid Storage Cooldown and Fill Procedure".

7.4 C-A-OPM 7.1.56, "25 KW Refrigerator for Warmup and Subsequent Cooldown for Contamination Removal".

8. Attachments

8.1 C-A-OPM ATT 7.1.53.a "Valve Position Tables".